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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,243	10/15/2001	Doron Handelman	HANDELMAN=1A	2683

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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/976,243	HANDELMAN ET AL.
	Examiner	**Art Unit**
	Nathan Curs	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. ("Lee") (US Patent No. 6288808) in view of Benhaddou et al. ("Benhaddou") ("New multiprotocol WDM/CDMA-based optical switch architecture"; Benhaddou et al.; Simulation Symposium 2001. Proceedings. 34th Annual, 22-26 April 2001, Pages 285-291).

Regarding claims 1 and 9, Lee discloses a method and optical switching apparatus (fig. 3, elements 24 and 25) that switches to a destination route (fig. 3, elements 26 to 30 and right-side output links and subscribers) upstream optical signal samples that are obtained from a first source (fig. 3, left-side input link 1), and upstream optical signal samples that are obtained from additional NCC sources (fig. 3, left-side input links 2 to N and subscribers and col. 3, line 60 to col. 4, line 25) and comprise at least one of the following: upstream optical signal samples that are separately obtained from NS sources (fig. 3, left-side input links 2 to N); and n series of upstream optical signal samples that are separately obtained from n sources and are carried over n discrete channel wavelengths (fig. 3, left-side subscribers and col. 4, lines 38-42), wherein the upstream optical signal samples obtained from said first source are provided at a data rate DRS (fig. 4 and col. 4, lines 26-60), the upstream optical signal samples obtained from the NS sources are provided at data rates DRSS.sub.j, and each series of upstream optical signal samples in the n series of upstream optical signal samples is carried over a discrete

channel wavelength .lambda..sub.i at a data rate DR.sub.i, where each of NCC, n and NS is an integer greater than or equal to one, i is an index running from 1 to n, and j is an index running from 1 to NS (figs. 4 and 5 and col. 4, lines 26-60), the apparatus comprising: an upstream optical converter unit operative to convert said upstream optical signal samples that are obtained from said first source and said upstream optical signal samples that are obtained from said additional NCC sources into a broadband combined series of upstream optical signal samples at a combined data rate DR.sub.c which is greater than any of the following: DRS; any separate DRSS.sub.j; and any separate DR.sub.i (fig. 3, elements 24 and fig. 4 and col. 4, lines 26-60); and an upstream router operatively associated with the upstream optical converter unit and operative to route said broadband combined series of upstream optical signal samples to said destination route (fig. 3, element 25 and col. 3, line 60 to col. 4, line 25). Lee discloses multiple sources, each sending a multi-wavelength WDM signal from a source to a converter (fig. 3, elements left-side sources 1 to N and fig. 4), but does not disclose that the optical signal samples obtained from the first source are obtained by a spread spectrum technique, or that the upstream optical signal samples that are separately obtained from NS sources are obtained by said spread spectrum technique. However, Benhaddou discloses WDM spread spectrum, where switching the spread spectrum data by allocating the data to fixed period cells and then switching the fixed period cells, using wavelength conversion, and multiplexing the switched data to a single outgoing wavelength, is also anticipated (pages 285-286, sections Abstract, 1 and 2, and page 287, col. 1, lines 3-20). It would have been obvious to one of ordinary skill in the art at the time of the invention that the WDM spread spectrum teaching could be applied to each of several of the multi-wavelength WDM signals from different sources (including NS plus one sources) in the system of Lee, to provide the benefit of increasing bandwidth (allowing multiple users to access bandwidth simultaneously), as taught by Benhaddou.

Regarding claims 2 and 10, the combination of Lee and Benhaddou discloses a method and apparatus according to claims 1 and 9, respectively, and wherein each of said upstream optical signal samples obtained from the first source and said upstream optical signal samples obtained from the NS sources comprises upstream optical signal samples that occupy a wavelength band (Lee: col. 3, line 60 to col. 4, line 25 and Benhaddou: page 285, Abstract, where each optical sample of a given WDM wavelength occupies the wavelength band of that WDM wavelength), and said upstream optical converter unit comprises: a multiplexing/demultiplexing unit comprising: a grouped add-drop multiplexer (GADM) which is operative to drop said upstream optical signal samples obtained from the first source (Lee: fig. 4, element 35), and at least one of the following: NS grouped ADMs operative to drop said upstream optical signal samples that are separately obtained from said NS sources (Lee: fig. 3, elements 24-1), and at least one ADM operative to drop the n series of upstream optical signal samples (Lee: fig. 3, elements left-side input Subscribers); an upstream wavelength converter unit operatively associated with the multiplexing/demultiplexing unit (fig. 3, elements 24 and fig. 4) and comprising: a broadband wavelength converter operatively associated with the GADM and operative to convert the upstream optical signal samples obtained from the first source that are dropped by the GADM into a first series of upstream optical signal samples centered around a channel wavelength .lambda..sub.D (fig. 3, element 24 and fig. 4 and col. 4, lines 26-60), and the following: at least one wavelength converter operative to convert any of the .lambda..sub.i that differ from .lambda..sub.D to .lambda..sub.D thereby forming a group of n series of upstream optical signal samples having the upstream optical signal samples carried over .lambda..sub.D (fig. 4 and col. 4, lines 26-60); and a combiner operatively associated with the upstream wavelength converter unit and operative to obtain said broadband combined series of upstream optical signal samples by combining the following: all said series of upstream optical

signal samples centered around said channel wavelength .lambda..sub.D, and the n series of upstream optical signal samples in said group (fig. 4, elements 38 to 42 and col. 4, lines 26-60).

Regarding claim 3, the combination of Lee and Benhaddou discloses a method according to claim 2 and also comprising selecting said channel wavelength .lambda..sub.D prior to said converting (fig. 4 and col. 4, lines 26-60, where the incoming channels converted to a wavelength to be routed to a destination is a disclosure that the outgoing wavelength is pre-selected).

Regarding claims 4 and 11, the combination of Lee and Benhaddou discloses a method and apparatus according to claims 1 and 9, respectively, and wherein each of said upstream optical signal samples obtained from the first source and said upstream optical signal samples obtained from the NS sources comprises upstream optical signal samples that are randomly spread in a plurality of bands around a plurality of wavelengths (Benhaddou: page 285, Abstract, where optical CDMA used for the WDM signals of NS sources, as described above for claims 1 and 9, would spread the optical signal samples across the wavelength band defined by the WDM spectrum), and said upstream optical converter unit comprises: a multiplexing/demultiplexing unit comprising: a random add-drop multiplexer (RADM) which is operative to drop said upstream optical signal samples obtained from the first source (Lee: fig. 4, element 35), and at least one of the following: NS random ADMs operative to drop said upstream optical signal samples that are separately obtained from said NS sources (Lee: fig. 3, elements 24-1), and at least one ADM operative to drop the n series of upstream optical signal samples (Lee: fig. 3, elements left-side input Subscribers); an upstream wavelength converter unit operatively associated with the multiplexing/demultiplexing unit (fig. 3, elements 24 and fig. 4) and comprising: a broadband wavelength converter operatively associated with the RADM and operative to convert the upstream optical signal samples obtained from the first source that

are dropped by the RADM into a first broadband series of upstream optical signal samples (fig. 3, element 24 and fig. 4 and col. 4, lines 26-60), and the following: at least one wavelength converter operative to convert any of the .lambda..sub.i to a channel wavelength .lambda..sub.D thereby forming a group of n series of upstream optical signal samples having the upstream optical signal samples carried over .lambda..sub.D (fig. 4 and col. 4, lines 26-60); and a combiner operatively associated with the upstream wavelength converter unit and operative to obtain said broadband combined series of upstream optical signal samples by respectively combining the following: the first broadband series of upstream optical signal samples, the NS broadband series of upstream optical signal samples, and the n series of upstream optical signal samples in said group (fig. 4, elements 38 to 42 and col. 4, lines 26-60).

Regarding claim 5, the combination of Lee and Benhaddou discloses a method according to claim 1 and wherein said destination route comprises the following: a destination fiber optic cable capable of carrying optical signal samples at said combined data rate DR.sub.c (fig. 3, elements 25 and 26, where the wavelength carried between these elements is an optical signal).

Regarding claims 6 and 12, Lee discloses a method and optical switching apparatus (fig. 3, elements 24 and 25) that switches to nn routes (fig. 6, right-side outputs) a broadband series of downstream optical signal samples, where nn is an integer greater than one and the broadband series of downstream optical signal samples is provided at a data rate DR.sub.T (col. 4, lines 16-60), the apparatus comprising: a downstream optical converter unit operative to convert the broadband series of downstream optical signal samples into nn series of downstream optical signal samples at data rates DRT.sub.1, . . . , DRT.sub.nn (fig. 3, element 24 and fig. 4 and col. 4, lines 26-60), the nn series of downstream optical signal samples comprising the following: NT broadband series of downstream optical signal samples and a

downstream router operatively associated with the downstream optical converter unit and operative to route said nn series of downstream optical signal samples to the nn routes respectively (fig. 6 and col. 4, line 61 to col. 5, line 32). Lee does not disclose that the broadband series of downstream optical signal samples are obtained by utilizing a spread spectrum technique. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the WDM spread spectrum teaching of Benhaddou with Lee as described above for claims 1 and 9.

Regarding claims 7 and 13, the combination of Lee and Benhaddou discloses a method and apparatus according to claims 6 and 12, respectively, and wherein said broadband series of downstream optical signal samples comprises downstream optical signal samples that occupy a wavelength band (Lee: col. 3, line 60 to col. 4, line 25 and Benhaddou: page 285, Abstract, where each optical sample of a given WDM wavelength occupies the wavelength band of that WDM wavelength), and said downstream optical converter unit comprises: a demultiplexer operative to separate said broadband series of downstream optical signal samples into nn series of downstream optical signal samples (fig. 3, elements 24-1 and fig. 4) comprising the following: NT broadband series of downstream optical signal samples centered around a channel wavelength .lambda..sub.T (col. 4, lines 26-60) and a downstream wavelength converter unit operatively associated with the demultiplexer and comprising the following: NT broadband wavelength converters operative to convert the NT broadband series of downstream optical signal samples centered around .lambda..sub.T into NT broadband series of downstream optical signal samples centered around NT channel wavelengths of which NT-1 channel wavelengths are different from .lambda..sub.T (fig. 3, elements 24 and col. 4, line 26 to col. 5, line 32); and a multiplexing/demultiplexing unit comprising at least one of the following: NT grouped add-drop multiplexers (GADMs) operative to add said NT broadband series of

downstream optical signal samples centered around NT channel wavelengths to NT routes of said nn routes respectively (fig. 3, elements 24 and fig. 4 and col. 4, lines 26-60).

Regarding claims 8 and 14, the combination of Lee and Benhaddou discloses a method and apparatus according to claims 6 and 12, respectively, and wherein said broadband series of downstream optical signal samples comprises downstream optical signal samples that are randomly spread in a plurality of bands around a plurality of wavelengths (Benhaddou: page 285, Abstract, where optical CDMA used for the WDM signals of NS sources, as described above for claims 1 and 9, would spread the optical signal samples across the wavelength band defined by the WDM spectrum), and said downstream optical converter unit comprises: a demultiplexer operative to separate said broadband series of downstream optical signal samples into nn series of downstream optical signal samples (fig. 4, elements 24-1 and fig. 4) comprising the following: NT broadband series of downstream optical signal samples (col. 4, lines 26-60); a downstream wavelength converter unit operatively associated with the demultiplexer (fig. 3, elements 24 and fig. 4) and comprising the following: NT broadband wavelength converters operative to convert the NT broadband series of downstream optical signal samples into NT broadband series of downstream optical signal samples randomly spread in a plurality of bands around a plurality of wavelengths (Lee: figs. 3 and 4 and col. 4, line 26 to col. 5, line 32 and Benhaddou: page 285, Abstract); and a multiplexing/demultiplexing unit comprising at least one of the following: NT random add-drop multiplexers (RADMs) operative to add said NT broadband series of downstream optical signal samples randomly spread in a plurality of bands around a plurality of wavelengths to NT routes out of said nn routes respectively (Lee: figs. 3 and 4 and col. 4, line 26 to col. 5, line 32 and Benhaddou: page 285, Abstract).

Regarding claim 15, Lee discloses an optical communication signal useful for communication to at least one of a node server (fig. 3, element 25) and an end node of an optical communication network (fig. 3, right-side elements 1-N and subscribers), the optical communication signal comprising a broadband series of optical signal samples having the optical signal samples carried at a data rate DR.sub.c, the broadband series of optical signal samples being produced by optically converting optical signal samples (fig. 3 and left-side source 1 and fig. 4 and col. 4, lines 26-60), and optical signal samples that are obtained from additional NCC sources (fig. 3, elements left-side sources 2 to N and subscribers) and comprise the following: optical signal samples that are separately obtained from NS out of the NCC sources (fig. 3, elements left-side sources 2 to N); and n series of optical signal samples that are separately obtained from n out of the NCC sources and are carried over n discrete channel wavelengths (fig. 3, elements left-side subscribers and col. 4, lines 38-42, wherein the optical signal samples obtained from said first source are provided at a data rate DRS, the optical signal samples obtained from the NS sources are provided at data rates DRSS.sub.j, and each series of optical signal samples in the n series of optical signal samples has the optical signal samples carried at a data rate DR.sub.i, where each of NCC, n and NS is an integer greater than or equal to one, i is an index running from 1 to n, and j is an index running from 1 to NS, and DR.sub.c is greater than any of the following: DRS; any separate DRSS.sub.j; and any separate DR.sub.i (figs. 4 and 5 and col. 4, lines 26-60). Lee does not disclose that the optical signal samples from the sources are obtained by utilizing a spread spectrum technique. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the WDM spread spectrum teaching of Benhaddou with Lee as described above for claims 1 and 9.

Regarding claim 16, the combination of Lee and Benhaddou discloses a communication network comprising a node server (fig. 3, element 25), a plurality of end nodes (fig. 3, elements right-side destinations 1 to N and subscribers), and a communication switch comprising the optical switching apparatus of claim 9 in operative association with the node server and the plurality of end nodes (fig. 6 and col. 4, line 61 to col. 5, line 32).

Regarding claim 17, the combination of Lee and Benhaddou discloses a communication network comprising a node server (fig. 3, element 25), a plurality of end nodes (fig. 3, elements right-side destinations 1 to N and subscribers), and a communication switch comprising the optical switching apparatus of claim 12 in operative association with the node server and the plurality of end nodes (fig. 6 and col. 4, line 61 to col. 5, line 32).

Response to Arguments

3. Applicant's arguments filed 31 October 2005 have been fully considered but they are not persuasive.

Regarding claim 1, the applicant argues that Lee and Benhaddou do not refer to upstream optical signal samples that are obtained from one or more sources by a spread spectrum technique. However, Benhaddou discloses optical signal samples obtained by a WDM spread spectrum technique, and in the combination the Benhaddou teaching applies to the WDM signals from different sources disclosed by Lee. In other words, the upstream sources disclosed by Lee are sending WDM spread spectrum signals downstream in the combination, based on the teaching of Benhaddou applied to the upstream sources of Lee. The applicant argues that the input to the Benhaddou module are only referred to as an input which includes WDM signals. However, it's the WDM spread spectrum signals output from

Benhaddou modules that are the upstream spread spectrum signals in the combination, as described in the rejection.

The applicant also argues that it is not clear where in the system of Lee the CDMA switches of Benhaddou can be integrated and how the CDMA switches of Benhaddou can operate in the system of Lee. However, these arguments are moot because the combination is not based on physically integrating the CDMA switches into the Lee hardware. However, Lee can process the WDM spread spectrum signals of Benhaddou, when received downstream from a Benhaddou module, since the signals in both Benhaddou and Lee are fixed period optical packets using WDM.

In response to applicant's argument that there is no motivation or suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In this case, the signals of both Benhaddou and Lee being fixed period optical packets using WDM provides motivation and suggests that the two teachings could be combined.

Regarding claims 2, 4, 7, 8, 10 and 11, the applicant asserts that Lee and Benhaddou do not show or suggest the features of the claims. However, the applicant does not provide any reasoning that shows a contrast between the claimed features and the citations and reasoning of the rejections; therefore the arguments are not persuasive.

Regarding claim 6, the applicant argues that Lee and Benhaddou do not refer to switching of downstream signals (the argument that Lee and Benhaddou do not refer to an input of optical signal samples obtained by spread spectrum was addressed above). However, the teachings of Lee and Benhaddou apply whether the input signals are coming from an upstream

or downstream direction. The argument against Lee and Benhaddou as being a one-way architecture is not persuasive because claim 6 does have any limitations that indicate a method of using the same equipment to operate on signals in opposing directions.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

5. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER